# Water Conservation Opportunities Peter Ford Manager – Federal Projects San Diego Gas & Electric Federal Project Management Business Line Team Leader Southwest Division Naval Facilities Engineering Command

### **Presentation Overview**

- Why Water Conservation
- Authority to Proceed
- Overall Water Rates
- Typical Analyses
- Project Review

### Why Water Conservation?

- Extremely Cost Effective (2-4 Yr Project Payback)
   Focus is on Shower Heads (Energy + Water)
- Results in Energy Savings (for many applications)
- Most Important:

Water Conservation provides the Federal Sector and the Utility with additional potential to install Energy Efficient Equipment

### **Additional Potential**

- 10 Year Simple Payback Desired
- For a 4 Year Payback on Water Measures:

Every \$1,000 of water conservation enables the installation of \$1,500 of energy efficient equipment without exceeding a 10 year payback.

### **Federal Authority**

- Executive Order 13123
  - Clearly Encourages Water Conservation
- GSA Areawide Agreements
  - Written to encourage cost effective installations
  - Allows broad interpretation of Utility services
  - Does not differentiate between Utility products
- Decision to proceed

Limited only by the Utility's service offering

**Utility Company Authority** 

- Water Conservation Saves Energy
  - Heating Energy (Gas & Electric)
  - Pumping Energy (City/Water District)

 $BHP_{Pump Shaft} = \frac{GPM \times TDH}{3,960 \times \eta_{Pump}}$ 

... or about 9.0 kWh per hour of usage for a 3 GPM Faucet

 Water conservation <u>must</u> be supported by the Utilities to achieve these energy reductions

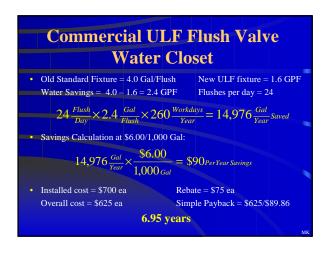
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# Water & Sewer Rates - Typical San Diego Rates - Commercial: • Water: \$3.75 per 1000 gallons (KG) • Sewer: \$2.25 per 1000 gallons (KG) • Total: \$6.00 per 1000 gallons (KG) - Residential: • Water: \$5.00 per 1000 gallons (KG) • Sewer: \$3.00 per 1000 gallons (KG) • Total: \$8.00 per 1000 gallons (KG)



# Residential ULF Tank Type Water Closet • Old Standard Fixture = 5.0 Gal/Flush Water Savings = 5.0 - 1.6 = 3.4 GPF Water Savings = 5.0 - 1.6 = 3.4 GPF $12 \frac{Flush}{Day} \times 3.4 \frac{Gal}{Flush} \times 365 \frac{Day}{Year} = 14,892 \frac{Gal}{Year} Savcd$ • Savings Calculation at \$8.00/1,000 Gal: $14,892 \frac{Gal}{Year} \times \frac{\$8.00}{1,000 Gal} = \frac{\$119}{Year} Savings$ • Installed cost = \$700 ea Overall cost = \$625 ea Simple Payback = \$625/\$119 5.25 years



Commercial ULF Flush Valve Urinal

• Old Standard Fixture = 3.0 Gal/Flush New ULF fixture = 1.0 GPF Water Savings = 3.0 - 1.0 = 2.0 GPF Flushes per day = 30  $30 \frac{Flush}{Day} \times 2.0 \frac{Gal}{Flush} \times 260 \frac{Workdays}{Year} = 15,600 \frac{Gal}{Year} Saved$ • Savings Calculation at \$6.00/1,000 Gal:  $15,600 \frac{Gal}{Year} \times \frac{\$6.00}{1,000 Gal} = \$93.60 \text{ Per Year Saved}$ • Installed cost = \$600 ea Simple Payback = \$600/\$93.60

6.41 years

Commercial ULF Shower Head

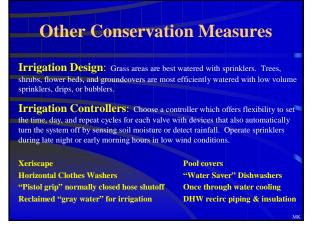
• Old Standard Fixture = 5.0 Gal/Minute New ULF fixture = 2.5 GPM Water Savings = 5.0 - 2.5 = 2.5 GPM Minutes per Use = 5

Uses Per Day = 3  $3\frac{Uses}{Day} \times 5\frac{Minutes}{Use} \times 2.5\frac{Gallons}{Minute} \times 260\frac{Days}{Year} = 9,750\frac{Gal}{Year}Saved$ • Savings Calculation at \$6.00/1,000 Gal and \$5.00/1,000 Gal Heating Assuming 50% Hot Water Use:  $9,750\frac{Gal}{Year} \times \left[\frac{$6.00}{1,000\frac{Gal}{Gal}} + \frac{$5.00}{1,000\frac{Gal}{Gal}} \times 50\%\right] = $82.88PerYearSaved$ • Installed cost = \$80 ea

Simple Payback = \$80/\$82.88

0.97 years







### Fleet Combat Training Center • Audit covered 19 Buildings • Mechanical Measures plus Water Measures • Fixtures Evaluated Low Flow Showerheads (Qty 26) Faucet Aerators (Qty 155) • Simple Payback • Average \$4.40/1,000 Gal (Water & Sewer) • 3.6M Gallons/Year Reduced • \$16,000 per Year Saved • \$68,000 Installed Cost 4.3 Year Simple Payback

### Fleet Combat Training Center • Mechanical Project - \$3M Total • Chiller Installation • Air Handler & Mechanical Renovation • Water Measures • Additional Work Supported • 4.3 Year Payback to a 10 Year Payback • \$68,000 Installed Cost • Direct Ratio \$90,000 of additional Mechanical Work 3% to 5% Increase in Potential

## Summary • Water Conservation Is Allowed • Authority to Incorporate is Present • Rates are the Key to Cost Effectiveness • Evaluate rates in your specific area • Calculations are Straight Forward • Focus on Shower Heads for Cost Effectiveness Water Conservation Makes Sense